Chandrakala Kunchi

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Professional Summary:

- About 10 years of experience in the field of testing and quality control aspects of polymer composites used in aerospace applications.
- Good communication skills and ability to work in teams as well as an individual.

Academic Profile:

Ph.D in Chemical Engineering, 2019, BITS-PILANI Hyderabad campus, Hyderabad.

Master of Science (M.Sc. Engg) by Research (Equivalent to M.Tech course with First class as per Regulations of V.T.University) in Chemical Engineering, 2009, V.T.University, Belgaum, Karnataka.

Bachelor of Technology (B.Tech) in Chemical Engineering with First Class, 1998, Sri Venkateswara University College of Engineering, Tirupati.

Professional Experience:

- **Worked as a Guest Faculty in the Chemical Engineering Department at JNTU Hyderabad from July 2019 to Dec 2019 and also from Aug 2020 - Oct 2020.**
- **Worked as a Research Scholar and Teaching Assistant in the Department of Chemical Engineering, BITS-PILANI, HYDERABAD CAMPUS, Hyderabad from Sep 2014 to June 2019.**
- **Environmental Engineer: 2011-2012 at EPTRI, Hyderabad.**
- **National Aerospace Laboratories (NAL), FRP Division, Bangalore.**
  Roles:
  Engineer: 1998-2001
  Senior Research Fellow: 2001-2006
  Project Engineer: 2007-2009

Key Projects:

1. HANSA: HANSA is a two seater indigenous all composite aircraft fabricated at FRP division, NAL, Bangalore. Glass reinforced epoxy/amine resin system was used to fabricate HANSA aircraft. The matrix materials as well as composite materials used for this aircraft were characterized/tested for the DGCA certification.

2. WIND MILL BLADE: For the wind mill blade, long pot life epoxy/amine system was used to fabricate 22.5m long GFRP blades for wind turbines-500KW.

- Characterization of raw materials used in the fabrication of wind mill blades.
- Neat resin castings were prepared; HDT & Tg were measured at various curing schedules.

3. COMPAC program (For Industry samples):

- Characterization of polymers using sophisticated instruments like DSC, TGA & FTIR.
- Characterization of thermosetting polymers using standard test procedures.
    - Viscosity measurements for resins like epoxy and polyesters
    - Density measurements (solids and liquids) & Gel time measurements
    - Weight fraction measurements (Burn out technique and acid digestion)
    - HDT measurements of neat resin castings

Research in brief:

Ph.D Thesis (Sep 2014-Mar 2019): Thermal and Mechanical Characterization of Human Hair Fibres

The protein present in human hair is keratin and its structure resembles nanocomposite wherein coexistence of amorphous keratin matrix and crystalline keratin intermediate filaments exists with high degree of intermingling. The hair cross-section is divided into three regions namely cuticle, cortex and medulla. Cortex is the thickest region and it contains elongated cortical cells of ~5 μm diameter and it influences the mechanical and thermal properties of hair. Since the hair quality depends on intermingled morphology of cortical cells and how the defects are structured in terms of crystalline and amorphous domains, one surface test (nanoindentation) and two bulk tests (tensile and thermal) are used to check the quality of hair. Nanoindentation (load in mN and depth in nm) equipped with Berkovitch diamond tip is used to indent on the hair fibre cross-section.

M.Sc (Engg.,) thesis work: Investigative studies on composite prepregs

Preparation of pre-pregs using two varieties of bifunctional epoxy resins as matrices and bi directional glass fabric as reinforcement. These pre-pregs were stored at sub-ambient temperature (-18°C). Composite laminates were fabricated using these pre-pregs. Thermal and mechanical properties of composite laminates were evaluated to determine the critical storage period of the in-house made pre-pregs for both the resin systems.

Teaching Experience:

Courses taught: Chemical Process Optimization, Process Modeling and Simulation, Thermodynamics tutorials, Chemical Engineering Labs.

Publications:

1. ***Chandrakala Kunchi***, Karthik Chethan Venkateshan, Ramesh Babu Adusumalli. Nanoindentation on hair cortex and medulla regions. Fibres and Polymers, 2019, 20 (7): 1538-1545 (Scopus Indexed).

2. Ramesh Babu Adusumalli, Karthik Chethan Venkateshan, ***Chandrakala Kunchi***, Surya R. Vadlamani. Tensile testing of single fibres, Procedia Structural Integrity, 2019, 14:150–157 (Elsevier).

3. ***Chandrakala Kunchi***, Karthik Chethan Venkateshan, N.V.N. Deeksha Reddy, Ramesh Babu Adusumalli. Correlation between mechanical and thermal properties of human hair. International Journal of Trichology, 2018, 10:204-210, (Scopus Indexed).

4. ***Chandrakala Kunchi***, Karthik Chethan Venkateshan, Ramesh Babu Adusumalli. Effect of Scalp Position on Tensile Properties of Single Hair Fibres. International Journal of Trichology, 2018, 10:218-228, (Scopus Indexed).

5. Shubham Mishra, ***Chandrakala Kunchi***, Karthik Chethan Venkateshan, Ravi Chandra Gundakaram, Ramesh Babu Adusumalli. Nanoindentation and Tensile testing of Human Hair Fibres. Journal of Materials Science, 2016, 51(22):10191-10204, (Scopus Indexed).

6. R Indu Shekar, M.N.Satheesh Kumar, P.M.Damodhara Rao, Z.Yaakob, T.M.Kotresh, Siddaramaiah, ***K.Chandrakala***, Studies on the Composites Produced from Co-weaved Poly Ether Ether Ketone and Glass Fiber Fabric. Journal of Composite Materials, 2011, 45(7): 741-749, (Scopus Indexed).

7. ***Chandrakala K***, Vanaja A, Rao RMVGK. Storage Life Studies on RT Cure Glass-Epoxy Prepregs. Journal of Reinforced Plastics and

Composites, 2009, 28(16):1987-1997, (Scopus Indexed).

Conference Proceedings:

1. *Chandrakala Kunchi*, Lokesh Anaparthi, Ramesh Babu Adusumalli. Application of Optical, SEM and Confocal Laser Scanning Microscopy in Hair Research, International Conference on Electron Microscopy & Allied Techniques (EMSI) Proceedings, 2017, ISBN 978 81 933428-1-7, 386-388

2. *Chandrakala K*, Bibhu Prasad T, Karthik Chetan V, R.B. Adusumalli. Trend Setting Innovations in Chemical Sciences and Technology - Applications in Pharma Industry - 2015 (TSCST- API 2015) organised by Centre for Chemical Sciences & Technology (CCST) Proceedings, 2015, ISBN 978-83-82829-48-5PP, 54-55

Conference Presentations:

1. *Chandrakala Kunchi*, Karthik Venkateshan, Ramesh Babu Adusumalli. Thermal Analysis of Human Hair. National Conference on Recent Advances and Challenges in Chemical Engineering and Applied Chemistry, 2018, March 16th - 17th, ANURAG Group of Institutions, Hyderabad.
2. Ramesh Babu Adusumalli, *Chandrakala Kunchi*, Karthik Venkateshan. Hardness and modulus measurement of single scalp hair fibres. 10th World Congress for Hair Research, 2017, Oct. 31st – Nov. 3rd, Kyoto, Japan.
3. Karthik Venkateshan, *Chandrakala Kunchi*, Ramesh Babu Adusumalli. Thermal and Mechanical behaviour of Human Hair fibres. 10th World Congress for Hair Research, 2017, Oct. 31st – Nov. 3rd, Kyoto, Japan.
4. *Chandrakala.K*, Deeksha N, Karthik V, Sanakar Ganesh P, Suresh Babu P and R.B. Adusumalli. Sample preparation for Nanoindentation of Hair Fibres. CHEMCON 2016, Dec. 27th -30th, IIT Madras.
5. *Chandrakala K*, Shubham Mishra, Sakshi Khandelwal, Pushkar Prasun, Karthik Chetan, Ramesh Babu Adusumalli. Nanoindentation Studies on Human Hair Fibers. Chemference 2015, Dec 5th-6th, IIT Hyderabad.

Trainings Undergone:

1. Trained on “Advanced Computational Fluid Dynamics” at M.S.Ramaiah School of Advanced Studies, Bangalore.
2. Completed a course on “Mathematical Modeling and Computer Simulation” organized by CSIR Center for Mathematical Modeling and Computer Simulation, Bangalore
3. Attended a workshop on “Thermal Characterization of Polymers and Composites” by NAL & ADE during ISAMPE, Bangalore Chapter.

Achievements:

Recipient of GATE 2000 scholarship with all India rank of 534.

Memberships:

1. Member (LAM-61795) - Indian Institute of Chemical Engineers (IIChE)
2. Life Membership (LM-1421) - Electron Microscope Society of India (EMSI)
3. Member - Hair Research Society of India (HRSI)
4. Member - Indian Society for Advancement of Materials & Process Engineering (ISAMPE)

References:

1. Dr RMVGK Rao, PhD (IISc), FNAE,
   Research Advisor and Consultant, Visiting Scientist, IISc, Bangalore,
   Adjunct Professor, Amrita Viswavidyapeetham University, Coimbatore,
   Governing Council Member, MVJCE, Bangalore,
   Formally, Scientist "G" Director Grade, Founder Head FRP Division
   and Technology & Business Development Consultant(Retd), NAL-CSIR,
   Bangalore. Tel: +91-80-26585471, M: +91-9845648471,
   E-mail ID: rmvgk@yahoo.com

2. Prof. Ramesh Babu Adusumalli
   Birla Institute of Technology & Science, Pilani, Hyderabad Campus,
   Jawahar Nagar, Kapra Mandal, Medchal District - 500 078
   Telangana, India. Tel: +91-40-66303-554, M: +91-9848723783
   E-mail ID: ramesh.babu@hyderabad.bits-pilani.ac.in

Personal Information:

Name: K Chandrakala
Father's Name: K Kannaiah
Date of Birth: 31-07-1976
Gender: Female
Marital Status: Married
Languages known: English, Hindi, Telugu and Kannada

DECLARATION

I hereby declare that all the information furnished above is true to the best of my knowledge.

K.Chandrakala